WHAT IS CLAIMED IS:

1. image encoding apparatus comprising:

conversion means for converting a coding target block within a coding target image into conversion information;

quantization means for quantizing the conversion information and generating quantized conversion information; and

encoding means for generating compression data by encoding the quantized conversion information based on predetermined entropy encoding rules,

wherein the encoding means encodes the block size, into which the coding target image is divided, and generates compressed block size information which is included in a header information,

and the entropy encoding rules are switched according to the block size.

2. An image encoding apparatus according to claim 1, further comprising dictionary storage means for storing a plurality of bases,

wherein the conversion means converts the coding target image into the conversion information including index information for specifying a basis used for decomposition of the coding target image among the plurality of bases, a coefficient by which the basis specified by the index information is multiplied, and

positional information for specifying a position where a pattern made by multiplying the basis specified by the index information by the coefficient is restored, based on a predetermined conversion rule,

the encoding means generates the compression data including a compression code made by encoding the quantized conversion information generated by the quantization means based on a predetermined compression encoding rule, and

the encoding means executes processing in which the encoding means divides the coding target image into a plurality of blocks, extracts, for each of the plurality of blocks, the quantized conversion information the positional information of which is included in the block, encodes, for each of the plurality of blocks, a flag for specifying existence of the quantized conversion information the positional information of which is included in the block, encodes, for each of the plurality of blocks, the number of items of quantized conversion information each of which includes the positional information included in the block, converts the positional information of the quantized conversion information into inter-block positional information specifying a relative position in the block in which the positional information is included, and encodes the quantized conversion

information, while changing size of the block, whereby the encoding means generates a plurality of compression codes, and includes a code relating to size of the block in which a bit rate of the compression code becomes at a minimum and the compression code generated at the size in the compression data.

3. An image encoding method including:

a conversion step in which conversion means converts a coding target block within a coding target image into conversion information;

a quantization step in which quantization means quantizes the conversion information and generates quantized conversion information; and

an encoding step in whcih encoding means generates compression data by encoding the quantized conversion information based on predetermined entropy encoding rules,

wherein, in the encoding step, the encoding means encodes the block size, into which the coding target image is divided, and generates compressed block size information which is included in a header information,

and the entropy encoding rules are switched according to the block size.

4. An image encoding method according to claim 3,

wherein, in the conversion step, the conversion

means converts the coding target image, based on a predetermined conversion rule, into the conversion information including index information for specifying a basis used for decomposition of the coding target image among a plurality of bases stored in dictionary storage means, a coefficient by which the basis specified by the index information is multiplied, and positional information for specifying a position where a pattern made by multiplying the basis specified by the index information by the coefficient is restored,

in the encoding step, the encoding means generates the compression data including a compression code made by encoding the quantized conversion information generated by the quantization means based on a predetermined compression encoding rule, and

the encoding means executes processing in which the encoding means divides the coding target image into a plurality of blocks, extracts, for each of the plurality of blocks, the quantized conversion information the positional information of which is included in the block, encodes, for each of the plurality of blocks, a flag for specifying existence of the quantized conversion information the positional information of which is included in the block, encodes, for each of the plurality of blocks, the number of items of quantized conversion information each of which

includes the positional information included in the block, converts the positional information of the quantized conversion information into inter-block positional information specifying a relative position in the block in which the positional information is included, and encodes the quantized conversion information, while changing size of the block, whereby the encoding means generates a plurality of compression codes, and includes a code relating to size of the block in which a bit rate of the compression code becomes at a minimum and the compression code generated at the size in the compression data.

5. An image encoding method according to claim 4,

wherein the quantization means quantizes the coefficient included in the conversion information to generate the quantized conversion information including a quantized coefficient,

when encoding the quantized conversion information in said processing, the encoding means extracts a minimum absolute value among absolute values of the quantized coefficients included in a plurality of items of quantized conversion information, includes a code relating to the minimum absolute value in the compression data, converts each of the quantized coefficients into a differential value between the

absolute value for each of the quantized coefficients and the minimum absolute value, includes the differential values in the compression code after encoding, and includes a positive or negative sign for each of the quantized coefficients in the compression code after encoding.

6. An image encoding method according to claim 4, wherein, in the encoding step, the encoding means uses arithmetic coding as the predetermined compression encoding rule and executes the arithmetic coding by using a predetermined probability table being different according to size of the block.

7. An image encoding program making a computer function as:

conversion means for converting a coding target block within a coding target image into conversion information;

quantization means for quantizing the conversion information and generating quantized conversion information; and

encoding means for generating compression data by encoding the quantized conversion information based on predetermined entropy encoding rules,

wherein the encoding means encodes the block size, into which the target image data is divided, and generates compressed block size information which is

included in a header information,

and the entropy encoding rules are switched according to the block size.

8. An image decoding apparatus comprising:

decoding means for generating quantized conversion information by decoding compression data based on predetermined entropy decoding rules;

inverse quantization means for inversely quantizing the quantized conversion information and generating conversion information; and

inverse conversion means for inversely converting the conversion information into a decoding target block within a decoding target image,

wherein the decoding means decodes compressed block size information which is included in a header information and generates the block size, into which the decoding target image is divided,

and the entropy decoding rules are switched according to the block size.

9. An image decoding apparatus according to claim 8, further comprising dictionary storage means for storing a plurality of bases,

wherein the decoding means decodes the compression data including a compression code made by encoding the quantized conversion information, based on a predetermined decoding rule, the quantized conversion

information being made by quantizing the conversion information which is made by conversing the decoding target image, based on a predetermined conversion rule, into index information to a basis used for decomposition of the decoding target image among the plurality of bases, a coefficient by which the basis specified by the index information is multiplied, and positional information for specifying a position where a pattern made by multiplying the basis specified by the index information by the coefficient is restored,

the inverse conversion means generates the decoding target image from the conversion information by using the plurality of bases stored in the dictionary storage means, base on a predetermined inverse conversion rule,

the compression data includes a code relating to size of blocks into which the decoding target image is divided, and the positional information included in the conversion information is made to be inter-block positional information specifying a relative position in the block in which the positional information is included, and

the decoding means refers to the code relating to size of the block included in the compression data and converts the inter-block positional information included in the conversion information into the

positional information specifying a position in the decoding target image.

10. An image decoding method including:

a decoding step in which decoding means generates quantized conversion information by decoding compression data based on predetermined entropy decoding rules;

an inverse quantization step in which inverse quantization means inversely quantizes the quantized conversion information and generating conversion information; and

an inverse conversion step in which inverse conversion means inversely convertes the conversion information into a decoding target block within a decoding target image,

wherein, in the decoding step, the decoding means decodes compressed block size information which is included in a header information and generates the block size, into which the decoding target image is divided, and

the entropy decoding rules are switched according to the block size.

11. An image decoding method according to claim 10,

wherein, in the decoding step, the decoding means decodes compression data including a compression code

made by encoding the quantized conversion information, based on a predetermined decoding rule, the quantized conversion information being made by quantizing the conversion information which is made by conversing the decoding target image, based on a predetermined conversion rule, into index information to a basis used for decomposition of the decoding target image among a plurality of bases, a coefficient by which the basis specified by the index information is multiplied, and positional information for specifying a position where a pattern made by multiplying the basis specified by the index information by the coefficient is restored,

in the inverse conversion step, the inverse conversion means generates the decoding target image from the conversion information by using the plurality of bases stored in dictionary storage means, based on a predetermined inverse conversion rule,

the compression data includes a code relating to size of blocks into which the decoding target image is divided, and the positional information included in the conversion information is made to be inter-block positional information specifying a relative position in the block in which the positional information is included, and

in the decoding step, the decoding means refers to the code relating to size of the block included in

the compression data and converts the inter-block positional information included in the conversion information into the positional information specifying a position in the decoding target image.

12. An image decoding method according to claim 11,

wherein the quantized conversion information includes a quantized coefficient being made by quantizing the coefficient,

the compression data includes the compression code made by encoding a code relating to a minimum absolute value among absolute values of the quantized coefficients included in a plurality of items of quantized conversion information, differential values between the absolute values of the quantized coefficients and the minimum absolute value, a positive or negative sign of the quantized coefficients, and

in the decoding step, the decoding means adds the minimum absolute value to each of the differential values included in the plurality of items of quantized conversion information generated by decoding the compression data with reference to a code relating to the minimum absolute value, and gives the positive or negative sign included in the quantized conversion information to an added value.

13. An image decoding method according to Claim

11,

wherein the compression code included in the compression data is generated by encoding with arithmetic coding in which a predetermined probability table being different according to size of the block is used as the predetermined compression encoding rule, and

in the decoding step, the decoding means executes inverse arithmetic coding based on the predetermined decoding rule by using the predetermined probability table according to size of blocks into which the decoding target image is divided.

14. An image decoding program making a computer function as:

decoding means for generating quantized conversion information by decoding compression data based on predetermined entropy decoding rules;

inverse quantization means for inversely quantizing the quantized conversion information and generating conversion information; and

inverse conversion means for inversely converting the conversion information into a decoding target block within a decoding target image,

wherein the decoding means decodes compressed block size information which is included in a header information and generates the block size, into which

the decoding target image is divided,

and the entropy decoding rules are switched according to the block size.